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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,895	01/16/2002	Gerhard Gross	MG-2280	2827
7590		03/24/2004	EXAMINER	
Connolly Bove Lodge & Hutz		DOROSHENK, ALEXA A		
PO Box 2207		ART UNIT		
Wilmington, DE 19899-2207		PAPER NUMBER		
		1764		

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AS

Office Action Summary	Application No. 09/857,895	Applicant(s) GROSS ET AL.	
	Examiner Alexa A. Doroshenk	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gross et al. (US 6,682,705 B1) in view of Fukada et al. (GB 2 274 110 A).

With respect to claim 1, Gross et al. disclose a process to carry out a reaction between gaseous and solid reactants in a fluidized particle layer, whereby:

a fluidizing gas flows through a loose bed of primary particles (col. 1, lines 4-6);
and

where a stream of a propellant gas loaded with solids powder (col. 2, lines 62-64) and accelerated to supersonic speed by means of a supersonic nozzle is blown into the fluidized particle layer transversally to the main flow direction of the fluidizing gas (col. 2, lines 10-13 and 20-25).

Art Unit: 1764

Gross et al. disclose that the nozzle can be in accordance with the formulae for Laval nozzles (col. 2, lines 49-50), but fails to disclose the specific structure for the nozzle.

Fukada et al. teach a nozzle/ejector (16, figure 2) which meets the formulae for a Laval nozzle. A Laval nozzle is also known as a convergent-divergent nozzle, which is basically a tube pinched in the middle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the nozzle of Fukada et al. for the process of Gross et al. since it is merely the selection of a nozzle known to the art which meets the specific nozzle design requirements of Gross et al.

The Fukada et al. nozzle (36) is characterized in that a propellant-gas stream loaded with solids powder is blown via a diffuser (34) positioned across from the nozzle (36).

With respect to claims 2 and 3, Fukada et al. further teach wherein the powder is held in a suction chamber (44) by pressure and sucked by the propellant gas (p. 3, lines 22-29 and p. 12, lines 6-12).

With respect to claims 13 and 20, it can be seen in figure 2 that the distance between the nozzle (36) and the diffuser (38) is such that the pressure in the chamber is minimal.

With respect to claim 4, Gross et al. disclose wherein the injected reactant can be one of many gases, including oxygen enriched air (col. 2, line 66- col. 3, line 7 and

Art Unit: 1764

claim 5) and wherein oxygen enriched air can also be the fluidizing gas (col. 4, lines 42-46 and claim 6).

With respect to claim 5, Gross et al. disclose wherein the injected reactant can be one of many gases, including chlorine and/or oxygen (col. 2, line 66- col. 3, line 1).

With respect to claim 6, Gross et al. disclose wherein the injected reactant is accelerated to a supersonic speed of at least Mach 1 to Mach 3 (col. 2, lines 58-61).

With respect to claim 7, Gross et al. disclose wherein the diffuser has an outlet opening (24) which has a negative pressure in that area (p. 13, lines 7-25).

With respect to claim 8, Gross et al. disclose a pressure reducing device (42) connected to the diffuser (38).

With respect to claims 9-11, Gross et al. disclose wherein the injected reactants can be solid (col. 2, lines 62-64) as well as wherein the fluidized particles can be reactants (col. 1, line 13). Gross et al. also reveal wherein the particles of the fluidized bed can be separated from the gas stream and recycled to a lower region of the reactor (col. 1, lines 7-13). Therefore, Gross et al. teach that the solids of the injection stream can be material recycled from the fluidized bed as well as the primary particles.

With respect to claim 12, Gross et al. disclose wherein the distributor plate is below the fluidized particle bed and that the nozzles are from 100-600 mm above the distributor plate (col. 2, lines 14-19 and lines 34-36). It is held that this description reads

Art Unit: 1764

on the propellant-gas stream being blown into the lower half, or quarter, of the fluidized bed.

With respect to claim 14, Gross et al. disclose a reactor to carry out a reaction in a fluidized particle layer (col. 1, lines 4-6) comprising:

said reactor having a distributor plate (feed tray) which a fluidizing gas is fed into a bed of primary particles located above the distributor plate in order to generate the fluidized particle layer (col. 2, lines 14-19);

having a reactor wall into which at least one feed device is inserted above the distributor plate (col. 2, lines 14-20); and

said device comprising a supersonic nozzle by means of which a propellant gas is accelerated to supersonic speed thereby generating a propellant-gas stream directed transversally to the main flow direction of the fluidizing gas (col. 2, lines 20-25).

Gross et al. disclose that the nozzle can be in accordance with the formulae for Laval nozzles (col. 2, lines 49-50), but fail to disclose the specific structure for the nozzle.

Fukada et al. teach a nozzle/ejector (16, figure 2) which meets the formulae for a Laval nozzle. A Laval nozzle is also known as a convergent-divergent nozzle, which is basically a tube pinched in the middle. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the nozzle of Fukada et al. for the specific nozzle of Gross et al. since it is merely the selection of a nozzle known to the art which meets the specific nozzle design requirements of Gross et al.

The Fukada et al. nozzle is characterized in that nozzle (36) lies across from a diffuser (38) and a suction chamber (44) that serves to feed in a solids powder is provided between the nozzle (36) and the diffuser (38) (see figure 2).

With respect to claim 15, it can be seen in figure 2 of Fukada et al. that the diffuser (38) is in the shape of a venturi tube.

With respect to claims 16 and 19, it can be seen in figure 2 of Fukada et al. that the diffuser (38) has an outlet opening (24) in connection with a pressure-reducer (42).

With respect to claim 18, it is held that the nozzle (36) can be moved toward to away from the diffuser (38) via chamber (46).

3. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gross et al. (US 6,682,705 B1) in view of Fukada et al. (GB 2 274 110 A), as applied to claim 16 above, and further in view of Anderson (4,095,747).

Gross et al. in view of Fukada et al. disclose all of the apparatus described above, in addition Fukada et al. disclose wherein the pressures of various portions of the nozzle are monitored (p. 11, lines 21-26) so that the pressure of the discharge port (24) is reduced (p. 13, lines 7-14).

Anderson teach a high pressure nozzle wherein a cap is provided at the nozzle tip to produce an annular gap (25) and functions to lower the pressure of the spray (col. 1, lines 20-23 and lines 28-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the pressure reduction cap of

Art Unit: 1764

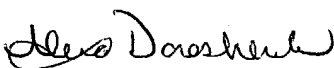
Anderson at the diffuser outlet (24) of the nozzle of Fukada et al. in order to provide a means to control the pressure at the outlet (24) as desired by Fukada et al.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexa Doroshenk
Patent Examiner
Art Unit 1764

March 18, 2004